Annual PTC Progress Report

2015

Long Island Rail Road

FRA-2010-0031

The Annual Positive Train Control (PTC) Progress Report is due by March 31^{st} of each year until full PTC system implementation is complete. The Annual PTC Progress Report must cover the railroad's implementation efforts and progress from the directly previous calendar year, and must be submitted electronically to the Federal Railroad Administration (FRA) via the FRA Secure Information Repository at https://sir.fra.dot.gov.

Name of Railroad or Entity Subject to 49 U.S.C. § 20157(a):

Railroad Code: LI

Annual PTC Implementation Progress Report for: 2015

PTCIP Version Number of File with FRA (basis for goals stated): rev 6.0

Submission Date: 3/31/2016

Contents

1.	Sur	mmary	3
2.	Up	date on Spectrum Acquisition	4
3.	Qu	antity Update on Hardware Installation	5
3	3.1.	Locomotive Status	5
3	3.2.	Infrastructure/Back Office Status	5
3	3.3.	Installation/Territory Status	6
4.	Qu	antity Update on Employees Trained	12
5.	Pro	ogress on Implementation Schedule/Milestones	12
6.	Sur	mmary Update of Challenges/Risks	12
7.	Pro	ogress on Revenue Service Demonstration (RSD) or Implementation	14
8.	Up	date for Intercity or Commuter Rail Passenger Transportation (if applicable)	17
9.	Up	date on Interoperability Progress and Other Formal Agreements	17
10.	Est	imated PTC Safety Plan (PTCSP) Submission Date (if not already submitted)	18
11.	Tes	sting and Integration Efforts (if applicable, laboratory, integration, and revenue service demonstration)	18
		dated Information That FRA Can Use to Maintain Its Geographic Information System (GIS) Database – Segments Complete le	

1. Summary

Narrative summary of overall PTC implementation progress during the preceding calendar year (January 1 to December 31):

In Automatic Speed Control (ASC) territory, LIRR's PTC system consists of Cab Signaling with ATC and ACSES II. IN non-ASC signaled territories, LIRR's PTC system consists of wayside ABS signaling and ACSES II.

For 2015, LIRR accomplished the following high level elements towards PTC compliance:

• Protection against overspeed derailment for critical curve restrictions have been completed using the railroad's cab signal/ATC system for those segments of the railroad equipped with cab signaling. For the non-cab signal segments, the speed governor of the rolling stock prevents overpeed derailments.

Note, the Speonk to Montauk segment of the Babylon Branch is currently in the process of replacing its non-ASC signaling with a new cab signal/ATC system.

- Attained a RRIF loan to assist in the funding or its PTC program. The loan obtained by MTA is approximately \$1 billion (covering both LIRR and Metro-North PTC implementations.)
- Filed necessary waivers with the FCC for use of the acquired IVDS spectrum for PTC.
- Had numerous technical meetings with Amtrak to resolve interoperability issues between the LIRR ACSES II system and Amtrak's. Many of the outstanding technical issues have been agreed-to.
- Advanced the project to provide ASC signaling on its non-signaled line from Speonk to Montauk.
- Progressed design to provide ASC signaling for its non-signaled line segment from Ronkonkoma to Riverhead.
- Filed and received approval from the FCC for PTC radio antenna pole installations for pilot locations.

Category	Quantity Installed During Calendar Year	PTCIP Year End Goal (If Applicable)	Cumulative Quantity Installed at End of Calendar Year	Total Quantity Required for PTC Implementation
Locomotives Fully Equipped	0	0	0	580
Installation/Track Segments Completed	0	0	0	14

Category	Quantity Installed During Calendar Year	PTCIP Year End Goal (If Applicable)	Cumulative Quantity Installed at End of Calendar Year	Total Quantity Required for PTC Implementation
Radio Towers Fully Installed and Equipped	0	0	0	80
Employees Trained	0	0	0	3194
Route Miles In Testing or Revenue Service Demonstration	0	0	0	321
Route Miles in PTC Operation	0	0	0	321

2. Update on Spectrum Acquisition

Spectrum Area or Location (E.g., county)	Spectrum Acquired and Available for Use (Owned/Leased) During Calendar Year	Cumulative Amount of Spectrum Acquired and Available for Use (Owned/Leased) at End of Calendar Year	PTCIP Year End Goal for Spectrum Acquired and Available for Use	Total Spectrum Required for PTC Implementation, as Reported in PTCIP
Spectrum Coverage Area or Location†: Click here to entertext.	Previously acquired spectrum available for use in New York, Brooklyn, Nassau, & Suffolk Counties, NY	500kHz (to be shared with Metro- North Railroad)	100%	LIRR share of 500kHz, approx 50%

Additional narrative for Spectrum Acquisition below:

LIRR's 220 MHz spectrum is in the IVDS band and requires waivers for power level and channel 13 interference. LIRR filed the waivers with FCC.

3. Quantity Update on Hardware Installation

3.1. Lo comotive Status

Category / Installation Feature	Quantity Installed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Installed at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP		
Locomotive (Apparatus) ¹						
On-Board Roof Antennas	0	0	0	580		
Undercar Scanner Antennas	0	0	0	580		
On-Board Computer	0	0	0	580		
Mobile Communication Package	0	0	0	580		

Additional narrative for Locomotive Status below. If any of the information called for in Section 3.1 is unavailable to the railroad at the time it is completing and submitting this form, please insert "TBD" in the appropriate field and/or use this comment box to explain when such information will be available and when the railroad expects to submit it to FRA.

Prototypes have been developed for installation of PTC equipment on 418 M7 EMU pairs. Surveys have been completed for all other rolling stock types except New York & Atlantic Railway freight locomotives and LIRR switcher locomotives. Designs were progressed for inclusion of PTC equipment on new M9 EMU pairs.

3.2. Infrastructure/Back Office Status

Category / Installation Feature	Completed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Complete at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP
Infrastructure (Back Office)				

¹ Railroads may elect to add categories or subcategories if more detail is desired.

Primary	0	0	0	1
Backup	0	0	0	1

Are the Back Office Location(s) fully operable?	No
Are the Dispatching Location(s) fully operable?	No

Additional narrative for Infrastructure/Back Office Status below:

Site surveys were completed and preparation of the Primary and Backup control centers for receipt of ACSES II Office equipment progressed.

3.3. In stallation/Territory Status

Category / Installation Feature	Quantity Installed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Installed at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP			
Infrastructure – Wayside Installations by Territory (i.e., Subdivision, District, Track Segment, Etc.) ²							
Subdivision / Installation Segment	: Port Washington Branch	(Pilot 2)					
Wayside Interface Units	5	5	5	7			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	7			

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² Each railroad should report information in a manner consistent with its PTCIP. That is, if a railroad monitors implementation of track segments by territory or subdivision, it should report that way.

Category / Installation Feature	Quantity Installed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Installed at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP			
Infrastructure – Wayside Installations by Territory (i.e., Subdivision, District, Track Segment, Etc.) ²							
Subdivision / Installation Segment	: Babylon to Patchogue (Pilo	t 1)					
Wayside Interface Units	2	2	2	12			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	8			
Subdivision / Installation Segment	: Main Line - KO to Riverh	ead Dark territory					
Wayside Interface Units	0	0	0	2			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	2			
Subdivision / Installation Segment: Main Line - Riverhead to Greenport Dark territory							
Wayside Interface Units	0	0	0	3			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	3			

Category / Installation Feature	Quantity Installed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Installed at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP			
Infrastructure – Wayside Installations by Territory (i.e., Subdivision, District, Track Segment, Etc.) ²							
Subdivision / Installation Segment	: Montauk Branch ASC Ter	ritory					
Wayside Interface Units	0	0	0	7			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	7			
Subdivision / Installation Segment	: Oyster Bay Branch						
Wayside Interface Units	0	0	0	7			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	6			
Subdivision / Installation Segment	Subdivision / Installation Segment: Port Jefferson Branch						
Wayside Interface Units	0	0	0	13			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	13			

Category / Installation Feature	Quantity Installed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Installed at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP			
Infrastructure – Wayside Installations by Territory (i.e., Subdivision, District, Track Segment, Etc.) ²							
Subdivision / Installation Segment	: Central Branch						
Wayside Interface Units	0	0	0	5			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	5			
Subdivision / Installation Segment	: Atlantic Branch						
Wayside Interface Units	0	0	0	5			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	5			
Subdivision / Installation Segment: Montauk Branch — Speonk to Montauk							
Wayside Interface Units	5	0	0	6			
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	6			

Category / Installation Feature	Quantity Installed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Installed at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP	
Infrastructure – Wayside Installations	Infrastructure – Wayside Installations by Territory (i.e., Subdivision, District, Track Segment, Etc.) ²				
Subdivision / Installation Segment	: Long Beach Branch				
Wayside Interface Units	0	0	0	1	
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	2	
Subdivision / Installation Segment	Subdivision / Installation Segment: Hempstead Branch				
Wayside Interface Units	0	0	0	2	
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	2	
Subdivision / Installation Segment: Far Rockaway Branch					
Wayside Interface Units	0	0	0	1	
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	2	

Category / Installation Feature	Quantity Installed During Calendar Year	PTCIP Year End Goal	Cumulative Quantity Installed at End of Calendar Year	Total Required for PTC Implementation, as Reported in PTCIP	
Infrastructure – Wayside Installations by Territory (i.e., Subdivision, District, Track Segment, Etc.) ²					
Subdivision / Installation Segment: West Hempstead Branch					
Wayside Interface Units	0	0	0	1	
Communication Cases, Poles, Antenna, Radio and BCP Equipment	0	0	0	1	

Additional narrative for Installation/Territory Status below. If any of the information called for in Section 3.3 is unavailable to the railroad at the time it is completing and submitting this form, please insert "TBD" in the appropriate field and/or use this comment box to explain when such information will be available and when the railroad expects to submit it to FRA.

Transponders:

Port Wash Branch (Pilot 2) – all transponder locations designed, 20 installed

4. Quantity Update on Employees Trained

Employee Category ³	Number of Employees Trained During Calendar Year	PTCIP Year End Goal	Cumulative Number of Employees Trained at End of Calendar Year	Total Reported in PTCIP
Employees who Install, Maintain, Repair, Modify, Inspect, and Test the PTC System	0	0	0	1288
Employees who Dispatch Train Operations	0	0	0	40
Train and Engine (Operations) Employees	0	0	0	1803
Roadway Worker Employees	0	0	0	63
Direct Supervisors of the Above Employees	0	0	0	Included in the above

Please provide any additional narrative for Employee Training below:

LIRR is developing the training program with its PTC System Integrator(SI). Some pilot classes have been developed by the SI and reviewed by the railroad and are being finalized.

5. Progress on Implementation Schedule/Milestones

The System Integrator is approximately 12 months behind schedule and on-board equipment deliveries are 6 months delayed. Mitigations are in-progress to recover schedule.

6. Summary Update of Challenges/Risks

Summary Update of Challenges/Risks below:

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³ See 49 C.F.R. § 236.1041(a).

- 1) <u>Use of the ACSES PTC System</u>: The ACSES II system was not specifically designed to meet the requirements of LIRR's high-density commuter operations, which are currently operated with a high degree of safety, reliability and on-time performance. Thus, there is an inherent risk in adapting this system to LIRR's extremely dense operations, even given extension of the implementation date.
 - LIRR's System Integrator products are not currently Type Approved. LIRR will have to undertake complex and time-consuming safety assessments and hazard analyses for FRA review and approval. Even for the elements of LIRR's system that are part of Type Approved, the PTC system will undergo modification requiring significant FRA review as a result of the necessary customizations related to LIRR's unique infrastructure and operating rules, as well as the need to enhance reliability to acceptable levels. While LIRR is working closely with its design consultant and System Integrator, the need for additional FRA product reviews (and the attendant time delays that accompany such reviews) may arise despite our best efforts.
- 2) Marketplace Constraints: Even though LIRR has a System Integrator Contractor to design and furnish its ACSES PTC system, the limited pool of qualified systems engineers and suppliers are having an adverse impact on the ability of LIRR to meet its PTC implementation schedule. The Contractor has taken extended periods to acquire the specialized staffing required for the magnitude of the LIR R ACSES implementation and has had some difficulty with retaining key staff.
 - LIRR paid for the Contractor's onboard systems supplier to increase its equipment production capacity, but startup difficulties and other issues have yet to benefit the LIRR schedule. Also, the Contractor's initial communications designer and supplier proved inadequate for the task and had to be replaced.
- 3) <u>Proprietary Products</u>. Proprietary products currently dominate the PTC marketplace, which is particularly problematic given the need for interoperability. There is no common and open specification based upon which vendors can design and manufacture systems and components nor is there time and opportunity to develop "open" specifications, particularly without the FRA taking the lead in this area. The lack of open specifications creates risk in two ways:
 - a) Despite their collective best efforts, railroads may not be able to get different and proprietary systems to function with a sufficient degree of interoperability so as to meet the objectives of the regulation.
 - b) Once PTC is implemented, the railroads will be locked into single suppliers for future improvements.
- 4) Interoperability. Interoperability creates risk from a technological perspective and in the fact that agreements are required with other railroads that operate on LIRR's system, both freight and passenger and for LIRR to operate on Amtrak territory. While we have made substantial progress with respect to general agreement on the systems to be installed, as well as progression of the technical design (yet to be implemented and tested), ultimately there must be agreement between affected railroads on the technical details and related commercial terms. As FRA does not have authority to resolve potential disputes, LIRR may, despite its best efforts, be unable to reach full agreement with all the involved railroads.

- 5) Communications and Data Radio. LIRR must have a PTC RF Communication System that is interoperable with Amtrak and other tenant railroads. The industry has not yet produced an interoperable "PTC radio" that is fully functional within the interoperability band of 217MHz to 222MHz. Development and commercial production of such a radio is largely out of the reasonable control of LIRR.
 - The implementation of PTC Data Radio is exacerbated by the high volume of trains LIRR operates in a relatively small geographical area, where channel interference is a major constraining factor for its own use, as well as potential interference with other operators in the area operating in the same frequency bands, such as New Jersey Transit, MNR, and Amtrak There are also potentially severe interference problems between the ACSES PTC Data Radio and the PTC data radio system being deployed by freight operators in the LIRR region
- 6) Railroad Resources. A further risk even to the extended Implementation deadline is the strain on LIRR's force account resources, which pursuant to collective bargaining agreements are required to do a significant amount of the implementation work, as well as LIRR's rolling stock maintenance shops, where in excess of 580 rail cars will require PTC retrofits. Given the labor and facilities constraints, and the need to maintain operation of high density commuter train service, we have significant concerns that this work can be completed in the requisite time frames.

7. Progress on Revenue Service Demonstration (RSD) or Implementation

Segment Identification⁴	Number of Route Miles in Segment	Status at End of Calendar Year Current status of installation/track segment. Choose one:	Estimated Start Date for Revenue Service Demonstration (if not already completed)
Segment (add additional rows for segments as necessary): Montauk Branch – ABS & CMB Territory (Pilot 1)	17	Not StartedInstallingTestingOperational/Complete	March 2018
Segment (add additional rows for segments as necessary): Port Washington Branch (Pilot 2)	16.5	○ Not Started⊙ Installing○ Testing○ Operational/Complete	March 2018

⁴ Segment identification should be consistent with segments listed in Section 3.3.

Segment Identification⁴	Number of Route Miles in Segment	Status at End of Calendar Year Current status of installation/track segment. Choose one:	Estimated Start Date for Revenue Service Demonstration (if not already completed)
Segment (add additional rows for segments as necessary): Montauk - Dark Territory – KO to Riverhead	25	Not StartedInstallingTestingOperational/Complete	April 2018
Segment (add additional rows for segments as necessary): Mainline - Dark Territory – Riverhead to Greenport	20.8	Not StartedInstallingTestingOperational/Complete	April 2018
Segment (add additional rows for segments as necessary): Montauk - ASC Territory	36.6	Not StartedO InstallingO TestingO Operational/Complete	May 2018
Segment (add additional rows for segments as necessary): Main Line - ASC Territory	46.8	Not StartedInstallingTestingOperational/Complete	June 2018
Segment (add additional rows for segments as necessary): Oyster Bay Branch	14.3	Not StartedInstallingTestingOperational/Complete	July 2018
Segment (add additional rows for segments as necessary): Port Jefferson Branch	32.6	Not StartedO InstallingO TestingO Operational/Complete	September 2018
Segment (add additional rows for segments as necessary): Central Branch	8.2	Not StartedInstallingTestingOperational/Complete	August 2018

Segment Identification⁴	Number of Route Miles in Segment	Status at End of Calendar Year Current status of installation/track segment. Choose one:	Estimated Start Date for Revenue Service Demonstration (if not already completed)
Segment (add additional rows for segments as necessary): Atlantic Branch	15.8	Not StartedInstallingTestingOperational/Complete	September 2018
Segment (add additional rows for segments as necessary): Montauk Branch – Speonk to Montauk	62.2	Not StartedInstallingTestingOperational/Complete	October 2018
Segment (add additional rows for segments as necessary): Long Beach Branch	7.3	Not StartedO InstallingO TestingO Operational/Complete	October 2018
Segment (add additional rows for segments as necessary): Hempstead Branch	6.5	Not StartedInstallingTestingOperational/Complete	November 2018
Segment (add additional rows for segments as necessary): Far Rockaway Branch	5	Not StartedInstallingTestingOperational/Complete	November 2018
Segment (add additional rows for segments as necessary): West Hempstead Branch	4.7	Not StartedO InstallingO TestingO Operational/Complete	November 2018

$Additional\, narrative\, for\, Revenue\, Service\, Demonstration\, or\, Implementation\, below:$

Design of wayside equipment for Pilot 1 was substantially progressed. RF propagation studies advanced for final placement of all wayside PTC antennas.

8. Update for Intercity or Commuter Rail Passenger Transportation (if applicable)

Update for Intercity or Commuter Rail Passenger Transportation below, if applicable:

All of the above pertains to Commuter Rail Passenger Transportation

9. Update on Interoperability Progress and Other Formal Agreements

Host and Tenant Railroads: Please provide a general update on interoperability in the textbox below.

Amtrak (host & tenant): LIRR has held numerous technical interoperability discussions with Amtrak. At the end of 2015, LIRR was finalizing technical design of the interfaces. Once design agreement is reached and formalized in an MOU, the work will progress to testing. LIRR's Pilot 2 location was selected specifically for its adjacency to Amtrak in order to test interfaces and functional interoperability.

New York & Atlantic Railroad (NYAR) (tenant): Interoperability discussions with NYAR and LIRR progressed. Consensus was reached on PTC system and implementation for NYAR locomotives enabling design, to proceed to be followed by an MOU and interoperability testing. Service agreement also remains to be finalized, particularly in regard to Temporal Separation of non-signaled territories.

Host Railroads Only: For each tenant, please provide additional tenant information below.

Tenant Identification (Please add rows	Estimated Tenant Locomotive Fleet (if the tenant	Current Tenant Implementation Status
for additional tenants as necessary)	does not have a separate PTCIP on file)	Choose one:
		O Not Started
National Railroad Passenger Service (Amtrak)	PTCIP is on file: docket FRA-2010-0029	O Installing
	PICIPIS OITHE. GOCKET FRA-2010-0029	O Testing
		⊙ Operational/Complete
NYAR		
	12	O Installing
	12	O Testing
		O Operational/Complete

10. Estimated PTC Safety Plan (PTCSP) Submission Date (if not already submitted)

If this section is not applicable to your railroad, please mark N/A.

PTCSP Submission Date

March 2018

Additional narrative for PTCSP Submission below:

No additional comments at this time

11. Testing and Integration Efforts (if applicable, laboratory, integration, and revenue service demonstration)

Update on Testing and Integration efforts below:

PTC hardware is undergoing extensive environmental testing including, shock & vibration, temperature tests, and EMI/EMC. The 220 MHz radios also have been lab tested for immunity to interference.

Transponder mountings underwent pilot installations in the railroad track.

The LIRR System Integrator has an integration lab for testing PTC functionality of Office, wayside, and onboard subsystems.

12. Updated Information That FRA Can Use to Maintain Its Geographic Information System (GIS) Database — Segments Complete and Operable

Additional narrative for GIS Information below:

No segments have been completed or have been updated with the GIS database information

Public reporting burden for this information collection is estimated to average 38.41 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for this information collection is **2130-0553**. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection, including suggestions for reducing this burden to OMB's Office of Information and Regulatory Affairs, Attn: FRA OMB Desk Officer.